UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

# COURSE SYLLABUS

# Basic Pharmacology

**2526-2-H4102D012**

## Aims

The objective of this course is to provide the general principles of pharmacology. Topics including pharmacokinetics and pharmacodynamics will be discussed. The course content emphasizes drug mechanisms, drug development and post-marketing surveillance. The student will learn to analyze and evaluate pathologies with a medical and scientific approach from a gender perspective to improve not only the knowledge on the different aspects underlying the differences but also the adequacy of the health intervention to stimulate greater attention to the collection of anamnestic, instrumental and laboratory data and to the drafting of records and reports in relation to the patient's gender.

## Contents

The course will examine the general principles underlying the destiny of drugs within the organism and the mechanisms responsible of their therapeutic and toxic effects. In addition, the preclinical and clinical processes of drug research and development, the post-marketing surveillance, drug patenting and access will be discussed.

## Detailed program

GENERAL PRINCIPLES - Concept of drug, toxic and placebo. - Methods for the assessment of toxicological risk and the extrapolation of toxicity data from animals to humans - Pharmacological history - How to report adverse drug reactions to the competent authorities (pharmacovigilance) - Ethical and socio-economic aspects of pharmacology.
PHARMACOKINETICS - Mechanisms that regulate the absorption of drugs through cell membranes - Routes of drug administration, their meaning in therapy and the concept of bioavailability - Mechanisms of drug distribution in the body, passage through cell barriers, drug-protein binding, biotransformation and excretion processes and their

clinical relevance - Significance of plasma half-life and clearance of a drug in dosage determination - Methods for achieving and maintaining steady-state plasma concentrations of a drug - Drug kinetics for single or repeated administration - Modification of dosage in relation to physiological and pathological changes in excretion and metabolism - Adverse drug reactions - Bases for a different response to drugs in different ages and in pregnancy.

CELLULAR AND MOLECULAR PHARMACOLOGY - Mechanisms of action of drugs, molecular targets and cascade of events through which a drug produces a response at the cellular level - Cellular basis of drug responses - Agonists and antagonists and principles of structure / activity relationship - Quantitative dose relationship - Response - Meaning of selectivity, specificity, toxicity, potency and efficacy of drugs - Efficacy and potency of drugs based on their dose-response curves - Therapeutic index and evaluation of the risk / benefit ratio of a drug therapy - Variability factors of a pharmacological response in relation both to concomitant pathologies and therapies and to populations of subjects at risk - Pharmacogenetics, pharmacogenomics and abnormal response to drugs.

MAIN CLASSES OF NON-STEROIDAL ANALGESIC DRUGS
MAIN CLASSES OF ANTIBIOTICS
MAIN CLASSES OF ANTIVIRAL DRUGS

## Prerequisites

Knowledge of human anatomy, physiology, pathology, chemistry, biochemistry.

## Teaching form

Lectures will be in attendance: 20 lessons of 2 hours. Lessons will be delivered in English in the form of lectures, exercises and discussions of simple clinical cases on pharmacological topics.

## Textbook and teaching resource

(1) Goodman & Gilman’s: The Pharmacological Basis of Therapeutics, Thirteenth Edition, McGraw Hill

## Semester

First semester

## Assessment method

The final evaluation will take place in presence and will consist of a written exam on the topics discussed in the course, with the resolution of simple calculations of doses and dilutions.

## Office hours

On appointment to be requested by email.

## Sustainable Development Goals

GOOD HEALTH AND WELL-BEING | QUALITY EDUCATION | GENDER EQUALITY